

WHAT IS CLAIMED IS:

1                   1.     A laser system comprising:  
2                   a laser generating a laser beam with a first frequency;  
3                   a non-linear optic disposed in an optical path of the beam, the non-linear  
4     optic effecting a conversion of the first frequency to a second frequency, the conversion  
5     varying with an angle of the non-linear optic relative to the optical path; and  
6                   a first member having a first thermal coefficient of expansion, the first  
7     member thermally coupled to the non-linear optic so that thermal expansion in a  
8     dimension of the first member with a change in temperature of the non-linear optic effects  
9     a change in the angle of the non-linear optic.

1                   2.     The laser system of claim 1, wherein the thermal expansion of the  
2     member effects a predetermined change in the angle of the non-linear optic when the non-  
3     linear optic undergoes the change in temperature, and wherein the predetermined change  
4     in the angle effects a desired adjustment in the conversion.

1                   3.     The laser system of claim 2, wherein the conversion provided by  
2     the non-linear optic also varies with a temperature of the non-linear optic, and wherein  
3     the angle-induced adjustment in the conversion compensates for temperature-induced  
4     changes in the conversion by the non-linear optic.

1                   4.     The laser system of claim 3, wherein the non-linear optic is pivoted  
2     by the member within the optical path so that the second frequency remains within a  
3     desired range when a temperature of the non-linear optic varies throughout a  
4     predetermined temperature range during operation of the laser system.

1                   5.     The laser system of claim 1, further comprising a second member  
2     attached to the first member, the second member having a second coefficient of thermal  
3     expansion, the second expansion coefficient being different than the first expansion  
4     coefficient, wherein differential thermal expansion alters a bend angle of the attached first  
5     and second members, the angle of the non-linear optic being mechanically coupled to the  
6     bend angle.

1                   6.     The laser system of claim 1, further comprising a beam control  
2     system for selectively directing the beam onto a cornea of a patient so as to effect a  
3     desired refractive change, the laser system comprising a laser eye surgery system.

1                   7.     The laser system of claim 6, wherein the laser comprises a solid-  
2     state laser, and wherein a frequency of the beam incident on the cornea is in a range from  
3     about 180 to about 210 nm.

1                   8.     A laser eye surgery system comprising:  
2                   a laser generating a laser beam with a first frequency;  
3                   a non-linear optic disposed in an optical path of the beam so as to define  
4     an angle relative to the beam, the non-linear optic effecting a conversion of the first  
5     frequency to a second frequency, wherein the conversion has an angle-induced change in  
6     with a change in the angle, and wherein the conversion has a temperature-induced change  
7     with a change in a temperature of the non-linear optic;  
8                   a compensator including a first member having a thermal coefficient of  
9     expansion, the first member thermally coupled to the non-linear optic so that the change  
10    in temperature of the non-linear optic effects a change in a dimension of the first member,  
11    the first member mechanically coupled to the non-linear optic, the change in dimension of  
12    the first member effecting the change in angle of the non-linear optic so that the angle-  
13    induced change in the conversion compensates for the temperature-induced change in the  
14    conversion; and  
15                   a beam directing system in the optical path from the non-linear optic, the  
16    beam directing system selectively directing the beam toward portions of a cornea so as to  
17    effect a desired change in a refractive characteristic of the cornea.

1                   9.     A method comprising:  
2                   generating a laser beam at a first frequency with a laser;  
3                   converting the beam to a second frequency with a non-linear optic,  
4     wherein the converting step varies with a temperature of the non-linear optic and with an  
5     angle defined by the non-linear optic and the laser beam;  
6                   passively compensating for temperature-induced variations in the non-  
7     linear optic by transferring heat to a member from the non-linear optic so that thermal  
8     expansion of the member adjusts the angle of the non-linear optic.